

FAA National Software Conference, May 2002

RTCA DO-254 Status and Overview

RTCA DO-254 UPDATE

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TODAY'S PRESENTATION WILL COVER

- ➔ **Background of DO-254**
- ➔ **Opinion Poll**
- ➔ **Benefits of DO-254**
- ➔ **Downside of DO-254**
- ➔ **Current status of the AC**

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BACKGROUND

- RTCA Document RTCA/DO-254, “DESIGN ASSURANCE GUIDANCE FOR AIRBORNE ELECTRONIC HARDWARE” issued April 19, 2000 was developed to address the certification challenges presented by the use of increasingly complex electronic hardware performing safety critical aircraft functions.
- The purpose of DO-254 is to provide guidance for design assurance during the development of airborne electronic hardware such that the hardware performs its intended function in a specified environment.

BACKGROUND

continued

- Document RTCA/DO-254 was the result of nearly 8 years of development by the RTCA SC-180 and EUROCAE WG-46 committees.
- Unfortunately, DO-254 has been greeted with mixed reaction from both the FAA and industry.
- This is due in part to opinions that the document overstepped its original intent.

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BACKGROUND

Continued

- FAA is currently developing an advisory circular (AC) to reference RTCA Document RTCA/DO-254. This new AC (AC 20 -TBD) will provide clarification of the FAA's intent for applicability of DO-254.
- Specifically, this AC will establish guidance for developers and users of Application Specific Integrated Circuits (ASICs), Programmable Logic Devices (PLDs) and Field Programmable Gate Arrays (FPGAs).

BACKGROUND

Continued

<u>FAILURE CONDITION CLASSIFICATION:</u>	<u>ASSURANCE LEVEL</u>	<u>QUANTITATIVE</u>
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- | | | |
|----------------------------|---|---------------|
| → Catastrophic | A | $P < 10^{-9}$ |
| → Hazardous / Severe Major | B | $P < 10^{-7}$ |
| → Major | C | $P < 10^{-5}$ |
| → Minor | D | None |
| → No Safety Effect | E | None |

per flight hour

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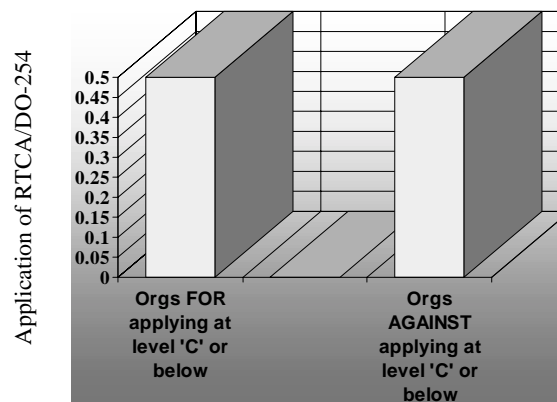
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BACKGROUND

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- This Advisory Circular (AC) will provide a means, *but not the only means*, to ensure electronic hardware designs that include functions classified as Catastrophic or Severe Major/Hazardous (*Level A and Level B assurance levels respectively*) meet assurance objectives.
- At the present time, the AC intentionally limits the application of DO-254 to these types of complex electronic hardware devices, however, it may optionally be applied to hardware designs which provide functions that have hazard severity classifications of *Major, Minor and No Safety Effect*.

Current Opinion Poll



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Benefits Derived From the Use of DO-254

SAFETY

Establishes the confidence that system development has been accomplished in a sufficiently disciplined manner in order to limit the likelihood of development errors that could impact aircraft safety.

IMPROVED EQUIPMENT

RELIABILITY

The Downside of DO-254

Increased Certification Effort = Time

Increased Developmental Costs = \$\$\$

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Status of Advisory Circular

- Currently in draft form and is now in FAA Headquarters Advisory Circular process mill.
- Expect internal FAA review to be completed by July 2002.
- May be released to the public for comment in August 2002 with final AC released December 2002.

Summary

- The FAA is working aggressively to finalize an Advisory Circular which would recognize RTCA DO-254 as appropriate guidance for the design assurance of complex electronic hardware.
- The final draft of the AC is now in FAA HQ and is being processed.
- Final interpretation of DO-254 (with regard to the AC) remains to be seen as we now have to run the “gauntlet”, i.e., the FAA comment periods (internally and publicly).